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**Derivation of human embryonic stem cell lines from biopsied blastomeres on human feeders with minimal exposure to xenomaterials.**

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**Funding Grants:** Optimization of Human Embryonic Stem Cell Derivation Techniques and Production/Distribution of GMP-Grade Lines

**Public Summary:**

**Scientific Abstract:**

In a continuous effort to improve the generation of therapeutic grade human embryonic stem cell (hESC) lines, we focused on preserving developmental capacity of the embryos, minimizing the exposure to xenomaterials, increasing derivation efficacy, and reducing the complexity of the derivation procedure. In this study, we describe an improved method for efficient derivation of hESC lines from blastomeres of biopsied embryos. Our protocol substituted feeder cells of mouse origin with human foreskin fibroblasts (HFFs), limited serum exposure of cells to formation of the initial outgrowth, and increased derivation efficacy from 12.5% (one hESC line out of 13 biopsies) to 50% (3 out of 6 biopsies) by using early population doubling (PD) HFFs. In addition, it eliminated a need for embryo-blastomere coculture, thus reducing the complexity of the culture and enabling continued development of the biopsied embryo under optimal conditions. All derived lines maintained normal karyotype and expressed totipotent phenotype including the ability to differentiate into trophectoderm and all three germ layers.

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